The Sustainability Footprints of Icebug

The purpose of this document is to share how Icebug calculates the sustainability impact of their products, the so-called sustainability footprint, where the carbon footprint is one part. Since 2015, we have reduced the impact of our products by sourcing more sustainable materials and manufacturing processes. This is a continuous work with long term goals. At Icebug, we have aligned our climate emission reduction targets with the science-based targets to stay below 1.5°C global warming. Icebug commits to the following reduction goal: *Reduce emissions from Icebug's value chain at least by 50% by 2030 from the base year 2015, and then cut them in half every 10 years to stay below a 1.5°C temperature increase.*

In order to measure our impact, make the right priorities in product development and refine and follow up our sustainability goals, we have introduced a set of sustainability key indicators, carbon footprint being one of them.

This document presents the sustainability indicators with special focus on carbon footprint calculations. It provides an overview of current methodology and assumptions, data sources, and future improvements. The Icebug footprint calculation tools will continue to evolve and improve over time with updated assumptions and methodology. Icebug presented the first carbon footprint in 2018 for Ivalo2 BUGRIP: 11.5 kg CO_2 e per pair. This was a result of a MidUniversity full scale Life cycle assessment (LCA). We are currently developing a simplified and automized calculation method together with the traceability platform provider TrusTrace, www.trustrace.se. Icebug today manages material and product information in TrusTrace and aims to make impact calculations in the same platform to get a smooth flow of information through our value chain.

Starting from the SS21 season, the sustainability key indicators will be applied to all Icebug shoe styles. Scan the Follow the Footprint QR code (or click the link) for Outrun RB9X SS21 and see the traceability of the supply chain and the sustainability indicators.

https://m.trustrace.com/product/Icebug/en/icebug-outrun-rb9x/product-footprint

Sustainability Indicators:

- 9.0 kg CO_2 e per pair of shoes (preliminary footprint result)
- 12% recycled material (PET, Milspeed and outsole rubber)
- 29% Bio based material (Bloom algae + natural rubber)

Actions to Reduce Product Footprint

Icebug produces traction footwear to enable and inspire people to move outdoors all year around. Our mission is to increase overall health through outdoor activities with minimal impact on the planet. The following practices are important to our product development and often result in a lower carbon footprint:

- We make shoes that last and provide repair kits so the shoes can be used as long as possible.
- We prioritize recycled materials to save resources and reduce waste.
- We prioritize manufacturing processes with low chemical and energy use, such as bluesign-certified textiles, solution-dyed textiles (coloring of fiber with low water use), digital print, Dritan and Leather Working Group (LWG) certified Gold Standard leather.
- We prioritize the use of natural materials such as wool, algae, hemp and natural rubber. We believe that natural materials, in contrast to petroleum-based materials, have the potential to act as carbon sinks through improved practices. Although natural materials, like wool, are not always low carbon from the start, they have the potential to be and Icebug is supporting the development to realize this potential.
- We require supply chain sourcing certifications such as Forest Stewardship Council (FSC) for tree products and packaging to ensure responsible sourcing. An ongoing project aims to increase Asian supply of FSC-certified natural rubber for shoes.
- We are exploring possibilities to use more renewable energy in the manufacturing facilities.
- We minimize packaging through design and use 98-100% recycled, FSC certified material.
- We prioritize shipping via ocean versus air.
- We strive for long-term relationships with our suppliers, and as member of Fairwear Foundation, we have support in our work for continuous improvements of labor conditions.

Icebug strives to substantially reduce climate emissions in the value chain. However, as a shoe producer, we will not reach zero emissions in the near future. In 2018, Icebug joined the UN Climate neutral now pledge and committed to measure, reduce and offset the climate emissions. We offset 200% of the calculated climate emissions of our entire business from 2019 and onward and have also purchased offsets covering 100% of our emissions since starting the business in 2001.

Sustainability Key Indicators

The Icebug sustainability key indicators must be robust to cover all potential development turns and remain the same for a long period of time (at least until 2030, see climate goals). We test the indicators during one year and if needed, we will adjust the indicator set in June 2021. Feedback is welcome and brands are also free to copy the indicators.

1. **Global warming potential, carbon footprint: kg CO2 equivalents per pair of shoes** – from Icebug carbon footprint calculation described below.
2. **Recycled material, weight -% of shoe** - from Bill of material, BOM, plus supplier certificates.
3. **Biobased material, weight -% of shoe –** from BOM list plus supplier certificates.
4. **Sustainably sourced materials, weight -% of shoe** - from BOM list plus supplier certificates.
5. **Low impact processing of materials, weight -% of shoe –** from BOM list plus certificates.

The % calculations are weight-based. Sometimes a material choice exposes conflicts between indicators – e.g., a biobased plastic can produce more climate emissions than the fossil one. It is important to bring those conflicts to the surface so that we can make choices based upon a holistic view of the sustainability consequences. **If we do not cover the bigger picture, there is a big risk that we sub optimize with too narrow of a focus.**

Initially, we only use three indicators in the marketing concept “Follow the Footprint” with QR codes to make it easier to understand, and the indicators 4-5 are used in the “backend” in Icebug’s evaluation of sustainability development of our company.

However, the sustainability indicators do not cover all sustainability aspects. For instance, hazardous chemicals are handled with restrictions lists (RSL) and regular test programs, in addition to sourcing low impact materials (indicator 5). Social aspects are only covered to some extent by certified sourcing like FSC and LWG. Below a description of each indicator:

1. Global Warming Potential, kg CO2 equivalents per pair of shoes
A given indicator, that connects to Icebug’s climate targets. Unit: kg CO2 equivalents per pair of shoes, size M10 – from carbon footprint analysis (see Method below). To calculate this indicator in a fairly accurate way we are depending upon reliable data for the materials climate impact from cradle (sourcing of raw material) to gate (the assembly of shoes). Sometimes from the specific supplier and sometimes from generic data.

2. Recycled material - weight-% of shoe
This indicator covers postconsumer recycled material and industrial waste recycling. Today Icebug uses recycled polyester in many materials, recycled wool, recycled nylon (Milspeed reinforcement) and recycled rubber. We always ask for recycling source certificates like GRS or similar to validate the sourcing.

3. Bio-based material - weight-% of shoe
Reflects Icebug’s quest to reduce the use of fossil materials and replace them with renewable bio-based materials. Today we use the biobased materials wool, algae, hemp and natural rubber. However, bio-based materials do not always lead to less climate impact, sometimes it’s even the opposite. A big part of the environmental impact of bio-based materials lays in the sourcing of the material (growing fiber or breeding animals). As a result, the bio-based materials demand more research of the specific value chain compared with e.g. fossil plastic where there is much available generic data.

4. Sustainable sourcing certified materials, weight -% of shoe
Shows the weight-% of all materials that have one or several types of sustainability certifications for sustainable sourcing of raw materials. It is relevant with organic sourcing (cotton, hemp, other cultivation), Forest Stewardship Council (FSC) for tree, cellulose and rubber, Responsible Wool Standard (RWS) or ZQ, Bonsucro (cultivation of sugar cane for bio plastic). These labels will be increasingly important as we use more bio-based materials.

5. Low impact processing of materials, weight -% of shoe
Shows the weight-% of all materials that have one or several types of sustainability certifications for reduced environmental impact in manufacturing processes and/or reduced chemical use. This indicator also includes low-impact coloring methods like Solution dye, digital print or no colouring even if those haven’t any formal certification. Today, we use the Leather Working Group (LWG) Gold Standard, DriTan leather, bluesign textiles.

The 4 and 5 indicator weight-% is based upon the presence of **one or more** certificates for a specific material. Only one is counted in the %. GRS certificates are not included here as they are confirming the recycling indicator. However, certificates that prove responsible sourcing of bio materials are included as they add sustainable value to the bio materials (that could be sourced with high or low degree of sustainability). As the upper textiles are of relatively low weight, the weight percentage of the whole shoe may seem low if there are no certificates on sole material.

Literature Review of Footwear LCAs

Limited research exists on the environmental impact of footwear production - there are few footwear LCAs and even fewer are transparent about detailed methodology and assumptions. We compiled a range of carbon footprints from approximately 7 kg CO_2 e per pair to 30+ kg CO_2 e per pair within the footwear industry.

The *Background Report for the EU Ecolabel of Footwear (2013*) and the *Quantis Report Measuring Fashion – Environmental Impact of the Global Apparel and Footwear Industries Study, 2018* give a consistent summary of the impact of Footwear:

The phases in the lifecycle with highest impact were identified as follows:

- Production of input materials, particularly leather and synthetic materials;
- Manufacturing of finished product.
- Distribution, use, and end-of-life phases are of minor importance.

Overall, the manufacturing as well as the raw material extraction stages are the biggest drivers across all impact categories. Transport accounts for only 2.5% of footwear's global impact and packaging production and disposal appear to be negligible, regardless of the selected indicator.

For Icebug, this means that we can create most sustainable value by finding more sustainable materials and reduce the impact in the shoe assembly process. Thus, this is our first priority.

A study by Massachusetts Institute of Technology (MIT) in 2012 of a running shoe ASICS GEL-KAYANO https://dspace.mit.edu/handle/1721.1/102070 was ranked as the best available Lifecycle Assessment (LCA) of footwear by the EU Ecolabel report and is still widely referred to as the most reliable footwear LCA. The MIT result for climate impact of shoes: 14 +/-2,7 kg CO_2 equivalents per shoe pair. 97% of this impact is incurred during the materials processing and manufacturing stages, which make up around 29% and 68% of the total impact, respectively.

Allbirds, a US footwear brand, started in 2020 to report carbon footprint for all their sneakers, showing that their average shoe emits 7.6 kg CO_2 e per pair.
https://www.allbirds.eu/pages/sustainability

This method document is inspired by Allbirds public method document and also structured similarly to make it easier to compare the footprints. We hope more brands will follow.

Carbon Footprint Calculation - Method

Functional Unit – What Are We Referring To?

In all Lifecycle Assessments, LCA, one must define a functional unit that frames the scope of the analysis and makes it possible to measure improvement on the product level. Icebug's carbon footprint is calculated for footwear and insoles products, using the functional unit **"One pair of shoes/insoles, men's size 10".**

- Footwear: Men's US 10
- Insoles: Men's US 9

Benchmarking other footwear LCAs, we found that Mens sizes US 8.5-US 9 are used as functional unit (Allbirds: US 9, AKU: US 8.5/EU 42, Icebugs LCA: US 9). However, for practical reasons we chose size US 10, our sample size in the development process, to get early estimates of the footprint. As our average sold size is probably smaller, Icebug will evaluate this for future footprint calculations, and follow the development of footprint standards.

We may sometimes present the result as kg CO_2 e per kg shoe to correlate weight differences between lighter running shoes and heavier walking and hiking shoes.

A big challenge is how to reduce sustainability impact while growing as a company. As the products makes up the majority of Icebug's total impact, the impact will necessarily grow with the turnover. Provided Icebug customers only buy what they need, one Icebug shoe will replace a standard shoe from the shelf. In this case, each shoe Icebug sells will contribute to lower the sustainability impact by the **difference between an Icebug shoes impact and the standard shoe impact**. This way of thinking can only be applied if there is no overconsumption of Icebug shoes and Icebug is a sustainability forerunner in the market.

As a reference, we calculate the carbon footprint of some Icebug styles using the sustainability data for conventional materials (without recycling, low impact dying etc.). Estimating that today's standard shoes have roughly the same climate impact as they had in 2015, the base year for Icebug's sustainability targets, this gives a baseline for comparison.

System Boundaries

Icebug's calculation method follows the **structure** of life cycle assessment methodology in accordance with the ISO 14040:2006 that describes principles and structure for life cycle assessment (LCA). However, the carbon footprint is simplified versus a fully detailed LCA:

- It only covers the climate impact while a full LCA also measures other ecological aspects such as water consumption, harmful emissions to air and water, biodiversity and land use etc.

- The simplification involves a footwear-based calculation formula, with predefined material impact values that can be repeated for several styles. However, there are still high demands in the material data quality that should be based on reliable LCA data and as close as possible to the specific material we are using.

Icebug initially concentrates resources (calculation and research) on the life cycle stages "materials" and "production/assembly", where there is most sustainable value to gain in product development (see literature above). We believe it's reasonable to put less focus in user and end of life phase at this initial stage when there are still so many gaps in the material data. However, as we gain knowledge and get more reliable data we will refine the calculations for all phases in the life cycle.

The material climate data includes all emissions associated with materials (raw material production/extraction as well as materials processing) up to the assembly factory gate, **so called "cradle to gate material data"**.

The product carbon footprint includes the following stages:

1. The cradle to gate material impact, summed up for all materials.
2. The manufacturing of soles and shoes impact, mainly energy use.
3. Transport from factory to warehouse and to customer.
4. Use by consumer, so far regarded as negligeable.
5. End of life impact, calculated as incineration in Sweden with energy recovery.

As the material analysis and the take-back systems for shoes evolve we will focus on finding more detailed user data and end of life/circularity data. Emissions associated with business model (retail/ecommerce) are not included in the product carbon footprint. Emissions associated with the electricity use of personal computers and the online shopping platform are not currently included.

Data Sources and the Algorithm

Data sources used to calculate the carbon footprint include a mix of primary (Icebug-specific) data and secondary data, including other life cycle assessments, material databases, and scientific literature reviews. Primary data is used when available. A summary of key data sources by life cycle stage is listed below:

Life Cycle Phase	Data Sources
Materials	Carbon intensities from supplier LCAs, Higg Material Sustainability Index (Icebug's reference to generic or customized materials), SSEI Swedish Shoe business environmental initiative, LCA bases like Ecoinvent and GabI (that Higg MSI is based upon).
Manufacturing	Primary energy consumption data from Icebug's assembly factories and sole factory. Energy grid intensities at country level from secondary data using IGES (Institute for Global Environmental Strategies) list of grid emission factors version 10.10 210223. For other fuel (wood, petrol and LPG) the Higg emission factors 2019 were used to translate energy units to kg CO2 e.
Transportation	Icebug's reported climate data from transports 2020/21. Upstream transportation data collected from Adnavem and then calculated using the GHG calculator from EcoTransIT (GHG WtW figure used). Downstream data was calculated using DHL Carbon Calculator for direct-to-consumer flow and calculation factors from Flexport was used for the wholesale flow.
Use	Not included, no user data available yet.
End of Life	Estimate of incineration in Sweden with energy recovery, using estimates as given by IVL/SSEI Swedish Shoe business environmental initiative.

1. Material Impact – Cradle to Gate:

The cradle-to-gate material impact shows the impact from sourcing and material manufacturing up to gate to product assembly factory (as the materials are delivered). The material data and certificates are given from Tier2-Tier 4 supplier and entered into the TrusTrace platform. The carbon impact figure can be given by generic data from material bases (Higg MSI, SSEI index, other) with cradle to gate LCA data, or from supplier. The source of data is shown for each material in the calculation sheet. When choosing between data we avoid underestimating and show if there is high degree of clear underestimation or overestimation for a particular material that lacks good data.

Icebug uses the Higg Material Sustainability Index (MSI) as a reference. Higg MSI has good possibilities to customize materials with sustainable features such as recycled content, bluesign certified fabric and solution dyed fabric. However, data for bio-based materials are so far few and not so specific.

The Swedish shoe sector environmental initiative has created a sustainability index, with absolute climate impact figures for material (kg CO_2 e/kg). These are also cradle=to-gate based and are shown in the footprint calculation sheet as a comparison.

Icebug add a factor 1.05-1.15 to include the material waste from cutting at assembly factory. Catting waste is typically 15% for leather and 5% for fabrics (source: Icebug supplier VBC).

The algorithm for material impact is the sum of the impact of each shoe material:

Weight, Material A, leather (kg) * 1.15 * Climate impact (kg CO_2 e per kg) = kg CO_2 e Material A
Weight, Material B, fabric (kg) * 1.05 * Climate impact (kg CO_2 e per kg) = kg CO_2 e Material B
Weight, Material C, fabric (kg) * 1.05 * Climate impact (kg CO_2 e per kg) = kg CO_2 e Material C
Sum up total climate impact from all shoe materials, cradle to gate (upto assembly)

2. Production Impact - Sole Production and Footwear Assembly:

Estimation from Tier 1 assembly factory how much energy is used for assembly of one product, and the relevant energy mix of the production site and the production country. Energy consumption per product = Total yearly energy consumption at factory * Icebug's share of production/number of Icebug pairs of products.

The table below shows the energy use in Icebug's factories for 2020. The emission factor for Vietnam electricity grid from IGES: 0,8795 kg CO_2 e per kWh (operating margin, 2018).

Icebug assembly Factory	**Energy per shoe pair (data January 2021)**	**kg CO_2 e per pair**	**Comment**
Great process, GTP, Ho Chi Mihn, Vietnam	1.8 kWh	1.6	Vietnam mix grid electricity, IGES
Fulgentsun, Hanoi, Vietnam	1.8 kWh	1.6	Vietnam mix grid electricity, IGES
Haksan Viina, Ho Chi Mihn, Vietnam	2.2 kWh	1.9	Vietnam mix grid electricity, IGES
Yi Chang sole production	Mix, grid electricity and wood	2.3 kg CO_2 e (mid- and outsole)	Mix, grid electricity, IGES. Wood, petrol: Higg emission factors.
Total energy per shoe pair	Real energy data as per above	3.9 - 4.2 kg CO_2 e	Sum of sole and shoe production

It is clear that the midsole production demands much more energy than the outsoles. This will be further explored in order to take actions to reduce midsole production energy use.

3. **Transports – upstream to Icebug's warehouse and downstream to customers:**

In the GHG bookkeeping 2020/21 Icebug reported total 182 tCO_2 e related to shoe transport, 128 tons from transport from factory to warehouse and 54 tons related to transports to customers. Divided by 216,277 pairs of shoes produced in 2020/21, this gives 0.96 kg CO_2 e per shoe pair, 0,61 kg CO_2 e from factory to stock (boat) and 0.35 kg CO_2 e from stock to customer, truck and flight (US delivery from webshop). This is an average not taking the styles' weight into account, which might be changed next year when we have total weight break-down per style from one whole year.

We will use the 2020/21 figures also for the FW21, SS22 and FW22 seasons footprint (they will all be calculated during 2021). Although general transport volumes are lower due to Covid, the product related transports will be directly correlated to sold volumes and as we divide into emissions per shoe, we see no risk of underestimation of transport emissions.

The transport of materials between sub suppliers (Tier 2-4) taken into account may vary between impact calculation tools. Higg MSI include a standard transport distance of 200 km for all materials. This aspect will be further developed in next version of Icebug's method.

4. **Use of product – not included:**

This would include the estimate of life span, repairs, treatment and potential second and third life cycles, where we have no real user data available yet. At present the user phase is not included as Icebug has only collected data from suppliers and no data from the market side yet. The EU Ecolabel of footwear (2013) and the Quantis report (2018) shows that the use phase is of minor importance (see above). The user phase will be further developed as we get more data about it.

5. **End of life:**

Estimate of mix of the brands biggest markets waste handling structure. For Icebug the Nordic market is biggest and today incineration is the dominating waste handling of shoes in the Nordic countries. In Sweden the energy from waste incineration is recovered for heating houses.

The Swedish shoe industry environmental initiative, SSEI, has developed an environmental index for typical shoe materials including both cradle-to-gate impact from production and end of life impact by energy recovery from the materials (as this is dominating shoe waste handling in Sweden). It takes into account the amount of electricity and heat generated from incineration of each material (the materials specific heat value, based on literature and technical data) that is thereby recovered energy. The model also takes into account the chemicals and energy used in the incineration process and the amount of carbon emissions from the incineration process per kg burnt material (based on fossil carbon content). Most plastics are fully oil-based while the carbon in bio-based materials is regarded as biogenic and doesn't contribute to climate change. For the biobased materials the carbon emissions from incineration are counted to zero. So as a thumb rule the waste emission average is negative, between -1 and -2 kg CO_2 e for all bio materials. For synthetic plastics the waste

emission average is around +1 kg CO_2 e / kg material. (ref. *Tomas Rydberg IVL/SSEI 200602)* We chose the conservative approach, using -1 kg CO_2 e.

The algorithm for End-of-life Impact is: 1 kg CO_2 e/kg material *(weight of synthetic materials minus weight of biobased material).

Icebug Reference Footprint

As a method benchmark, Icebug made a footprint analysis of our Outrun running shoe:

LCA Icebug LCA of Outrun (685 g per pair)	
Life Cycle Stage	**kg CO_2 e**
Materials, shoe materials (inc. cutting waste)	3.36
Materials, packaging, shoe box and transport box	0.30
Production, midsole and outsole, Yi Chang	2.31
Production, assembly, Fulgentsun	1.55
Transport, from factory to stock	0.61
Transport, from stock to customers	0.35
Use, no data	negligeable
End of life, Incineration with energy recovery (685 g, 12 % biobased materials)	0.52
Total:	**9.0 kg CO_2 e**

The Information Flow

The process to calculate climate footprint and other sustainability indicators starts with the material suppliers (Tier 2-4) adding supplier and material information into the TrusTrace platform. The shoe assembly factory (Tier 1) or Icebug puts in a Bill of Material (BOM list) for each style with weight of each material, for a pair of shoes Men's size US 10 (the functional unit of Icebug's carbon footprint).

The specific materials are then grouped into material categories with similar sustainability features that can be matched with climate data (e.g. 100% recycled polyester, 100% recycled polyester that is also solution dyed and bluesign certified etc.). Some materials have specific climate data from the supplier. Initially the SS21 Collection footprints were calculated manually in an excel sheet. Work is ongoing to automize the calculation within the TrusTrace platform, creating an integration with Higg MSI to match with climate data.

Material information -Commercial -Sustainable -Physical	**Style BOM list** Detailed with weight per material	**BOM list – group similar materials** Match all materials with climate data.	**Life cycle phase specific data** -Manufacturing -Transport	**Footprint calculation** SS21 Icebug excel FW21 automatic in TrusTrace?
From Tier 2 material suppliers to TrusTrace	From Tier 1 suppliers to TrusTrace	4 indicators ready: recycled, biobased, certified sourcing and low impact.	Real data from factories and real transport data. Update once a year.	Result: Carbon footprint

Limitations and Future Improvements

Icebug's footprint calculation tool will continuously evolve from this first version. We will continue to update our methodology based on improvements to underlying data, as well as in-line product changes. Icebug is working with LCA experts and climate networks to continuously improve our approach to carbon footprinting. From the first season's footprint, we see these main limitations:

- While we strive to make our materials and manufacturing assumptions as specific to our supply chain as possible, in some cases (due to lack of data) we use global industry averages. For some materials we use generic (general) data that don't fully consider the specific sustainability features of Icebug's materials. We therefore expect the results to become somewhat different with a higher degree of specific material data. Some examples:
    - **Leather data** in Higg MSI do not include sourcing certifications that show responsible land management or the animal welfare. The MSI base has few options regarding regional differences and specific features such as organic farming. There is also no option of Leather working group or Dritan that Icebug uses. We therefor estimate that our leather climate impact is overestimated not giving credit for energy savings of LWG gold standard and Dritan qualities.

    - The **wool data** is also lacking possibilities for specifications of land management and responsible wool farming. However, Icebug only uses recycled wool, that is possible to choose in the Higg MSI.

    - Natural rubber and cellulose based fabrics lack the option of responsible land management and farming, such as Forest Stewardship Council (FSC) or similar programs.

    - Icebug generally sees that **biobased materials have less accurate data** in the Higg MSI than synthetic materials, which will give biobased materials unproportionally big climate impact in comparison with synthetic materials. Icebug searches for strategies to get access to more correct climate data for biobased materials, that we believe is the future provided they are produced in a responsible way.

- The sustainability data quality from material suppliers varies a lot. The impact values to use must be decided from case to case – for some materials the generic values are considered most reliable and for others the supplier can provide the most exact value. However, it's very important to secure that we only use material data with approximately the same system boundaries, the so called "cradle-to-gate" data.

- When we use a range of data sources, there can be discrepancies in the scope and methodology. We do our best to ensure that values from different sources are comparable, though sometimes we are unable to confirm. In these instances, we choose conservative assumptions (see example above: end of life bio-based materials).

- There seem to be big uncertainties in the electricity grid emission factors. We used the Vietnam official emission factor of 2018 that is presented in IGES: 0.8795 kg CO_2 e per kWh (operating margin, 2018). However according to CEIA Vietnam (Clean energy investment accelerator) the Vietnam net is considerably greener now than in 2018, due to more renewables in the energy mix. The SAC Higg emission factors electricity grid data is locked by license (International Energy Agency IEA/GaBI data). When back counting from one of our assembly factories energy use in the Higg FEM report, the Vietnam factor used was 0.47 kg CO_2 e/kWh so the Higg emission factor is nearly half of the official Vietnam factor, however not publicly available as a transparent reference.

- The functional unit size (US 10 for shoes) probably gives a higher carbon footprint than is representative for the totality of sold collections. Our average shoe is estimated to be smaller, around US 7 or US 8. Icebug will follow the development of environmental footprint standards and evaluate the best way to define the functional unit.

Log of Changes in Different Versions

This will become a log to follow changes between different seasons calculations. It will be important when we do long time series of the development and compare in a correct way, for instance comparing the result of 2030 with the estimation of the base year 2015.

To add in next version:

- More specific values for recycled wool and for leather.
- Emission factor in Vietnam relatively high? Look for IEA factors as well.
- Make energy in production and transport values weight related when we have a whole year's weight break-down per style SS + FW21.
- Evaluate if the functional unit size should be smaller than now (US 10 shoes and US 9 insoles) to give a more correct representation of the average of sold products.
- Renewable energy emission factors.

Please give us feedback, and feel free to use this method!